

# **Integrating Public Health Practice Guidelines in Clinical Systems: A Case Study at Denver Health**

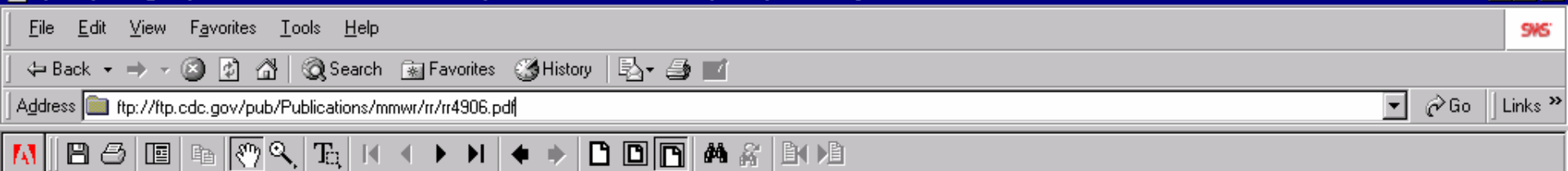
**Public Health Information Network Conference  
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# Objective

**To enable CDC guidelines to be distributed in an Electronic Medical Record (EMR) system and presented at the point of care**

- **Encode selected guidelines in a standard executable format e.g. GLIF, Arden syntax**
- **Implement in an EMR system**
- **Evaluate the effectiveness**



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# **MMWR™**

**MORBIDITY AND MORTALITY  
WEEKLY REPORT**

## *Recommendations and Reports*

Education Examination

### **Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection**

# Public-Private Collaborative

- CDC – Public Health Practice Program Office & Division of TB Elimination
- Denver Health
- Denver Public Health Department
- Siemens Medical Solutions
- Agency for Healthcare Research & Quality (provided funding to DH under Integrated Delivery System Research Network)

# Denver Health



Number of persons at risk

# **Data Availability in EMR/Clinical Systems**

- **Patient data**
- **Clinical data**
- **Ancillary services data**
- **Inpatient & ambulatory data**
- **Interface with adjunct systems for administrative & other clinical data**

# Identification of Data Source

## (Subset)

|  |   |
|--|---|
| <b>Recent Immigrant within 5 years</b>       | <b>Recent contact</b>                         |
| <b>Injection Drug User</b>                   | <b>HIV(+)</b>                                 |
| <b>Diabetes mellitus</b>                     | <b>Abnormal chest x-ray</b>                   |
| <b>Hematologic disorder</b>                  | <b>Immunosuppressive therapy</b>              |
| <b>Chronic renal failure</b>                 | <b>Person in high risk congregate setting</b> |
| <b>Weight loss &gt;10% ideal body weight</b> | <b>Prior PPD skin test</b>                    |
| <b>Regular alcohol user</b>                  | <b>Chest x-ray normal</b>                     |
| <b>Child exposed to adult at high risk</b>   | <b>Smear/culture results positive</b>         |
| <b>Homelessness</b>                          | <b>Pregnant or 3 mos. postpartum</b>          |

# TB Screening Project Goals

- **Determine whether care providers will comply with the computerized reminders**
- **Determine whether complying with the rule improves TB screening**
- **Determine the feasibility of using technology to improve adherence**
- **Demonstrate the effectiveness of collaboration between an integrated safety-net provider, a federal government agency and a private company**



# Potential Operational Impact on DH Clinics

- **~55% of Patients Have a Latent TB Risk Factor (Range of 20%-90% by Clinic)**
  - **~20% Due to Country of Origin**
  - **~12% Due to Diabetes**
  - **~10% Due to Hematologic Disease**
  - **~8% Due to Alcoholism**
- **Estimated that 10-20% Will Have Positive PPD**
- **Final Rule Triggers On Foreign Born Less Than 40 Years Old**

File

Edit

View

Favorites

Tools

Help

Address

http://netaccess.smshealthconx.net/d0nx-ntap-bin/webcptun.exe/tst/1?KEY=PTNINVISION:O:1025:1040139540

Go

Patient: Rules, Testing

User: TB Log Off

Visit History

Clinical Summary

Lab Results

Microbiology All

Pathology Reports

Radiology Results

Display/Print Orders

Current Orders

Write Orders

Lab Order Search

DH Formulary

Allergies

Problem List

Demographics

Future Appointments

Rules

Clinical Utilities

DH Pulse

Useful Hints

Contact Us

TB Screening

TB Screening Status

PPD Ordering

PPD Administration

PPD Reading Information

TB Follow-up:

TB Screening Status

Message

Text

This patient needs to be screened for need for a PPD.

Previous PPD

List

Previous or Current TB:

List

Text

Birth country risk

List

Foreign Born, Years in USA

Num

TB risk factor(s)

List

Chronic alcoholic

Chronic liver disease

Diabetes

Text

1) TB contact

2) Homeless

3) Chronic alcoholic

4) IVDU

5) Hematological disorders

6) Chronic liver disease

7) Immunosuppressive state

8) HIV/AIDS

9) Carcinoma of head/neck/lungs

10) Silicosis

11) Weight loss (10%)

12) Jejunioileal bypass

13) Gastrectomy

14) Diabetes

15) Other, doc. risk factor below

PPD Order

Reason PPD

List

Text

PPD Schedul

Date

Last Result

12/12/2002 04:19 PM by TB

test

11/26/2002 04:32 PM by TB

Prev. PPD results unknown

11/21/2002 03:58 PM by TB

Current TB, not under treatment

10/01/2002 10:41 AM by TB

High risk

10/01/2002 10:41 AM by TB

22

12/17/2002 08:39 AM by TB

Homeless

Hematological disorders

Immunosuppressive state

Silicosis

Last Result

10/01/2002 10:41 AM by TB

R/O Active TB

10/01/2002 10:41 AM by TB

02/02/2000

10/01/2002 10:41 AM by TB

Programs

Start

TB view with chart...

Inbox - Microsoft Outlook

TB updates - Message [...]

Microsoft PowerPoint - [...]

8:40 AM



User: TB  

PPD Manufacturer

12/17/2002 08:40 AM by TB

Text

|  |  |
|--|--|
|  |  |
|--|--|

Wveth

[PDF Reading Information](#)

1.4. Data

http://netaccess.smshealthconx.net/d0nx-ntap-bin/webcpass.exe/tst/1?FILE=CIF\_INCLUDE\_CVE\_D...

### PPD Reading Information

PPD INTERPRETATION GUIDELINE

[Based upon CDC guidelines for Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection, June 2000]

[<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.html>]

>5 mm of induration is considered positive for:

- HIV infection
  - Organ transplants
  - Immunosuppressed (receiving the equivalent of 15 mg/d of prednisone for 1 month or more)
  - Recent close contact with persons with infectious TB
  - Abnormal chest radiographs consistent with prior TB (fibrotic changes)
- >10 mm of induration is considered positive
- Recent immigrants (i.e., within the last 5 yr) from high prevalence countries
  - Injection drug users

## TB Follow-up

12/17/2002 08:40 AM by TB

List

\_\_\_\_\_

Will discuss at next visit

Text

|  |  |
|--|--|
|  |  |
|--|--|

Update

Clear All

Page created: Tuesday, December 17, 2002 8:41 AM For: TB

[Top of Page](#)

# Preliminary Results

- ~14% of patients "flagged" for the need for LTBI screening
- ~17% of the "flagged" patients actually received a PPD with a 76% show rate for the reading
- ~20% overall are receiving appropriate screening for LTBI when "flagged"
- 46% have a positive PPD among those with a reading
- Assuming all no shows were negative, the positive rate would be ~35%

# **Lessons Learned To Date**

- **Collaboration can facilitate the process**
- **External funding provides significant catalyst**
- **Workflow process issues outweigh technology issues**
- **Rules writing is complex**

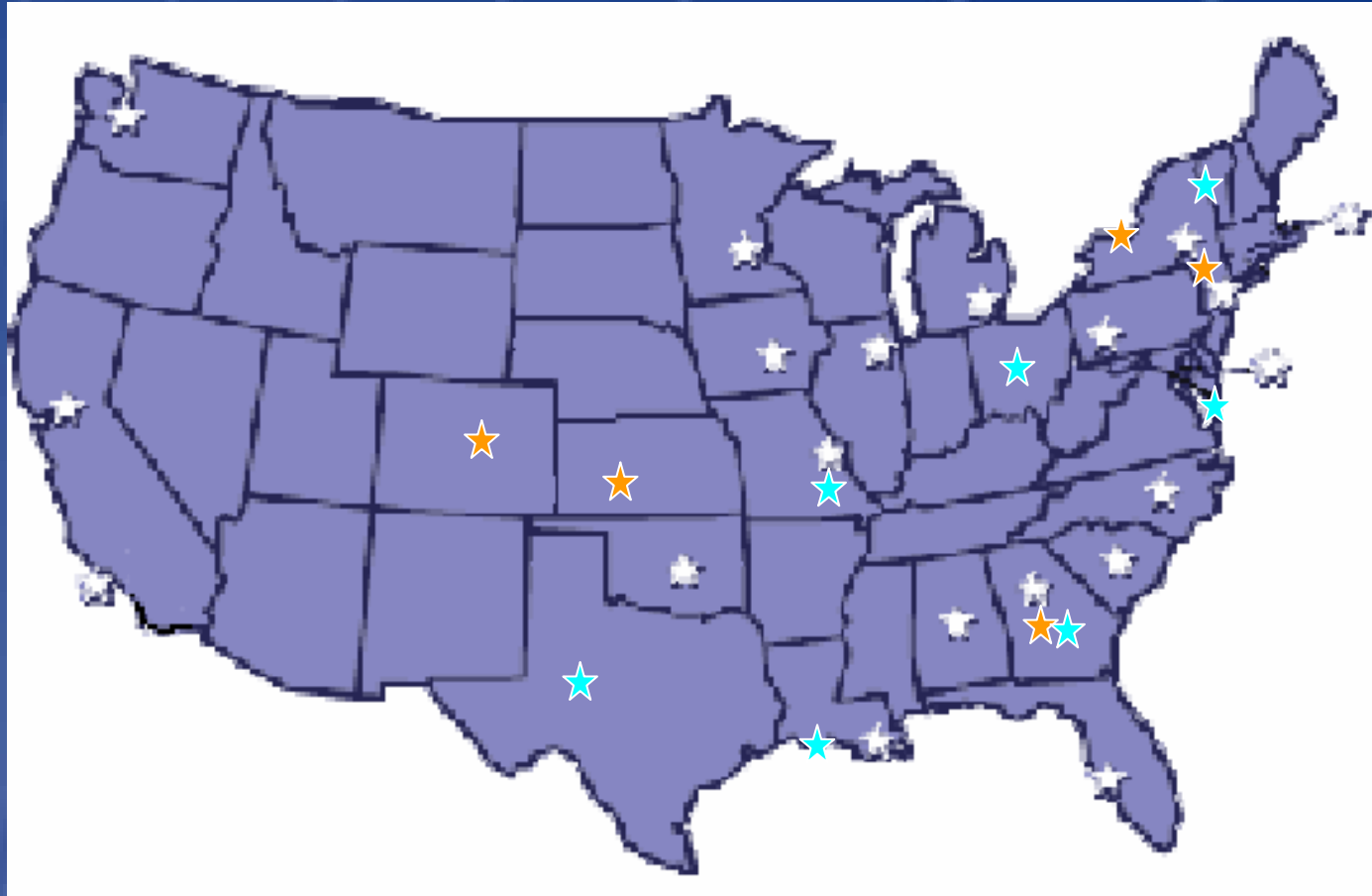
# **Other Potential Public Health Areas of Benefit**

- **Hospital Infections**
- **Patient Safety (NHSN)**
- **HIV**
- **STD – Chlamydia Screening**

# Potential for Implementation under PHIN

- Exchange of messages between health care systems and Local Health Departments on high risk persons
- Adoption of standard format for encoding guidelines
- Dissemination of encoded guidelines at point of care

# Centers for Public Health Preparedness



★ Academic Center (19)

★ Advanced Practice Center (5)

★ Specialty Center (7)

*(CDC-funded)*

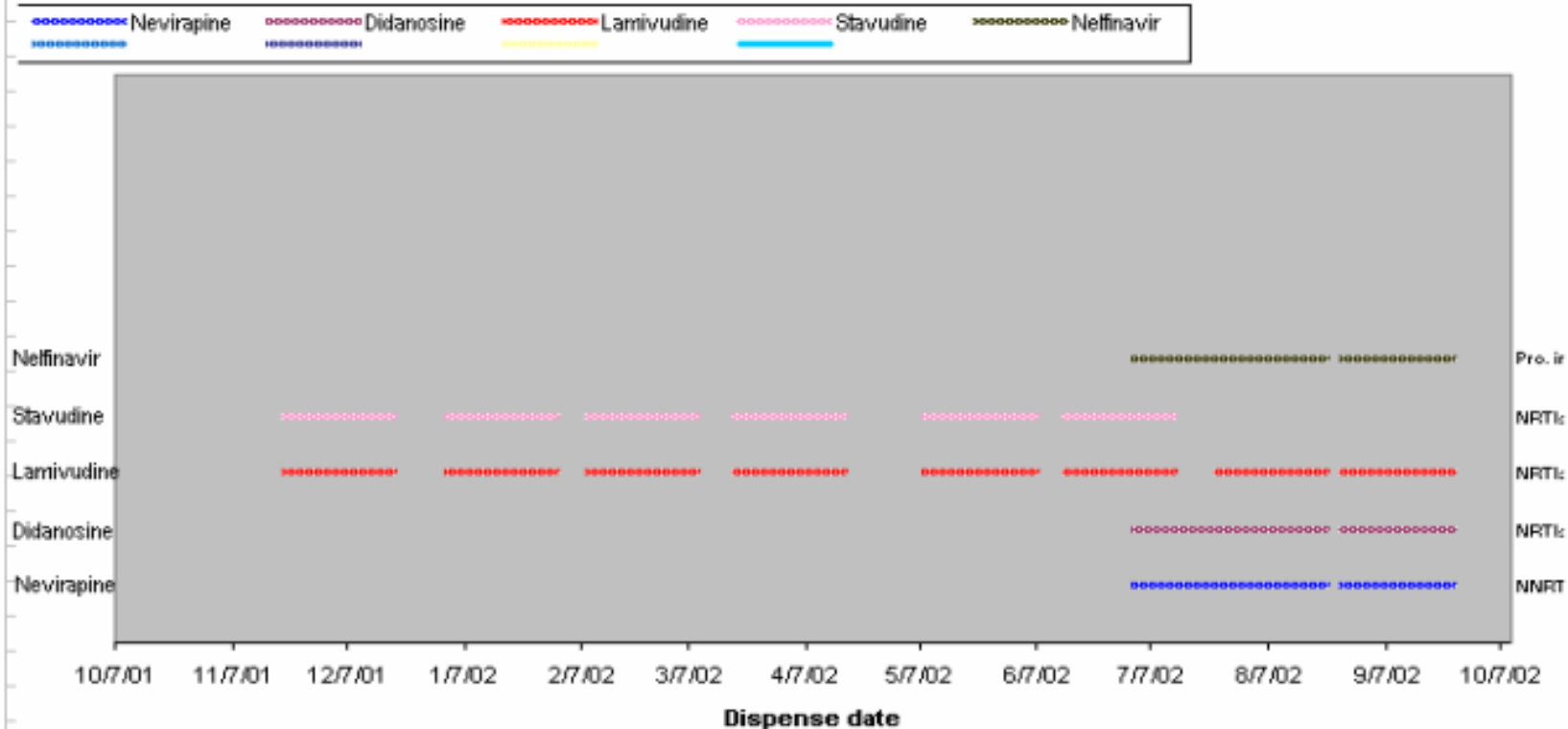


# Messaging

- lab/ICD-9 codes (reportable diseases)  
↔LHD ↔CDPHE
- STD clinic ↔CDPHE
- syndromic surveillance (DH) ↔LHD/CDPHE
- lab (Quantiferon) (DH) ↔LHD
- pharmacy (NDC) (DH) ↔LHD/CDPHE

## Encoded Guidelines

- Chlamydia screening (HEDIS)



From 10/07/01 To 10/07/02

☐ Laboratory ☒ Pharmacy

Run

Print

Patient

DHH No.

# Messaging

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↔LHD ↔CDPHE
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## Encoded Guidelines

- Chlamydia screening (HEDIS)

# Contact Information

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